

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* KENNETH P. WILSON

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Appeal 2006-2160  
Application 09/896,439  
Technology Center 1700

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Decided: September 15, 2006

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Before GARRIS, WALTZ, and FRANKLIN, *Administrative Patent Judges*.  
WALTZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the Primary Examiner's refusal to allow claims 1 through 20, which are the only claims pending in this application, as amended subsequent to the Final Rejection (see the Amendment dated Aug. 3, 2004, entered as per the Advisory Action dated Sep. 9, 2004; Br. 2-3).<sup>1</sup> We have jurisdiction pursuant to 35 U.S.C. § 134.

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<sup>1</sup> We refer to and cite from the "Supplemental Appeal Brief" dated Sep. 16, 2005.

According to Appellant, the invention is directed to a method of insulating or thermally protecting a rocket motor assembly, where a precursor of a rocket motor ablative material is formed from at least one aromatic polyamide in the form of a yarn having a denier per fiber of 1.5 to 3.0 (Br. 3). The structure formed from the precursor material is carbonized to form a reinforcement structure, which structure is then impregnated with a resin to form the rocket ablative material (*id.*). Claim 1 on appeal is illustrative of the invention and is reproduced below:

A method for insulating or thermally protecting a rocket motor assembly, comprising:  
providing a precursor material comprising at least one aromatic polyamide, the precursor  
material having a denier per fiber ranging from 1.5. denier per fiber to 3.0 denier per fiber; carbonizing the precursor material to form a reinforcement structure;  
impregnating the reinforcement structure with a resin matrix to form a rocket motor ablative material; and  
using the rocket motor ablative material on a portion of a rocket motor assembly.

In addition to Appellant's admitted prior art (APA), the Examiner has relied upon the following references as evidence of obviousness:

Lambdin	US 3,573,086	Mar. 30, 1971
Hirsch	US 3,576,769	Apr. 27, 1971
Binning	US 3,699,210	Oct. 17, 1972

Claims 1-6 and 13-15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the APA in view of Binning and Lambdin (Answer 3). Claims 7-12 and 16-20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the APA in view of Binning, Lambdin, and Hirsch

(Answer 4).<sup>2</sup> Based on the totality of the record, we AFFIRM all rejections on appeal essentially for those reasons stated in the Answer, as well as those reasons set forth below. We refer to the Brief and the Answer for a complete exposition of the countervailing arguments for and against patentability.

## OPINION

### A. The Rejections over the APA, Binning and Lambdin

The Examiner finds that the admitted prior art discussed on pages 1-3 of the Specification discloses carbonizing a viscose rayon woven mat, impregnating it with a resin, and lining the interior of a rocket nozzle with the impregnated material to act as an ablative material (Answer 3). The Examiner further finds that it was known in the admitted prior art that the precursor viscose rayon woven mat was no longer available (*id.*). The Examiner finds that Binning discloses carbonizing a polyaramide fiber mat, combining it with a resin, and using this material in nose cones or rocket nozzle exhausts (*id.*). The Examiner also finds that Binning teaches that rayon is a less preferred fiber to use in this environment (*id.*). From these findings, the Examiner concludes that it would have been obvious to one of ordinary skill in this art at the time of Appellant's invention to replace the unavailable rayon of the admitted prior art with the preferred polyaramide of

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<sup>2</sup> The Examiner also repeats two other rejections (Answer 6, 7). However, as noted by Appellant (Br. 14-15), these rejections are essentially the same as the above cited rejections, involving the same claims, the same issues, but merely reversing the order of two references. Therefore, in the interest of judicial economy, we consider the two above cited rejections with our remarks equally applying to the remaining rejections on pages 6 and 7 of the Answer.

Binning for use as ablative material in rocket nozzle environments (*id.*). We agree.

The Examiner recognizes that the APA and Binning are silent as to the denier of the fibers used to form the reinforcement structure (Answer 3). The Examiner applies Lambdin for the teaching of making carbonized impregnated fiber composites from rayon to be used in rocket nozzles, where the denier of the fiber is about 2.3 (*id.*). The Examiner concludes that it would have been obvious to one of ordinary skill in this art to use any conventional size fiber, and cites Lambdin as evidence that 2.3 denier fibers have previously been employed in carbonized impregnated fiber composites useful in rocket nozzles (Answer 3-4). We agree.

Appellant argues that the Examiner's proposed motivation to combine references is improper (Br. 6, 8). Specifically, Appellant argues that the fact that rayon is no longer available does not provide the requisite motivation to use aromatic polyamide as the alternative to rayon (Br. 8). We disagree. We determine that the fact that rayon is no longer available would have provided the motivation to one of ordinary skill in this art to seek alternative materials that provide the same or similar properties. Thus one of ordinary skill in this art would have been led to Binning, who discloses an alternative aromatic polyamide precursor material used with resins to produce plastic composites with satisfactory physical properties to be useful in rocket nose cones and exhaust nozzles (col. 2, ll. 34-41; and col. 3, ll. 17-20). Furthermore, we determine that the fact that rayon is taught by Binning as a less preferred fiber starting material (col. 3, ll. 22-30) would have also motivated one of ordinary skill in this art to use the aromatic polyamide starting material of Binning as a substitute for the rayon of the APA.

Appellant argues that Lambdin only teaches using a rayon yarn having a denier of 2.29, not an aromatic polyamide yarn (Br. 9). Although this argument is technically correct (see Lambdin, col. 3, ll. 25-35), Appellant has not addressed the Examiner's position that the use of any conventional denier fiber would have been well within the skill of the art (Answer, 4). *See In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990)(Where the difference between the claimed invention and the prior art is some range or variable, case law has consistently held that applicant must show that the particular range is critical). Furthermore, Appellant has not responded to the Examiner's position that Lambdin is directed to the same material as the APA (rayon), and thus one substituting the aromatic polyamide of Binning for the rayon of the APA would have used a similar size (denier) fiber (Answer 10).<sup>3</sup>

For the foregoing reasons as well as those reasons stated in the Answer, we determine that the Examiner has established a prima facie case of obviousness based on the reference evidence. Based on the totality of the record, including due consideration of Appellant's arguments, we determine that the preponderance of the evidence weighs most heavily in favor of obviousness within the meaning of § 103(a). Therefore we AFFIRM both rejections on appeal based on the combination of the APA, Binning and Lambdin.

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<sup>3</sup> We note that the Examiner additionally relies on Ogawa (US 4,830,845) and Ezekiel (US 3,635,675) as evidence establishing the obviousness of the claimed denier range (Answer 10). Since these references have not been cited in the statement of the rejection (Answer 3), we will not consider these references as part of the Examiner's evidence of obviousness. *See In re Hoch*, 428 F.2d 1341, 1342 n.3, 166 USPQ 406, 407 n.3 (CCPA 1970).

B. The Rejections over the APA, Binning, Lambdin and Hirsch

The Examiner applies the APA, Binning, and Lambdin as discussed above, further finding that these references do not specifically disclose the poly(m-phenyleneisophthalamide)[NOMEX] recited in the claims on appeal (Answer 4). However, the Examiner finds that Binning discloses a polyaramid where the phenylene cannot be ortho-, thus leaving only choices of meta- or para- substitution (Answer 5). The Examiner further cites Hirsch as evidence that NOMEX is useful as a polyaramid starting material in a carbonization process to form ablative composites (*id.*). From these findings, the Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of Appellant's invention to use NOMEX as the polyaramid in the process of Binning (*id.*). We agree.

Appellant argues that the cited references do not provide a motivation to combine to produce the claimed invention (Br. 11-12). Appellant argues that the products of Hirsch include semicarbonized aromatic polyamides and these products are distinguished from the products of a carbonizing process (Br. 12). Appellant also argues that Binning does not teach or suggest that the aromatic polyamide is a poly(meta-arylamid) merely by using phenylenes which are not ortho- (Br. 13).

Appellant's arguments are not persuasive. As correctly found by the Examiner (Answer, sentence bridging 4-5), Binning only discloses two possible phenylene substitutions, i.e., meta- and para. Disclosure of such a small genus is tantamount of a description of each species. *See In re Schaumann*, 572 F.2d 312, 315-17, 197 USPQ 5, 9 (CCPA 1978); *In re Petering*, 301 F.2d 676, 681-82, 133 USPQ 275, 279-80 (CCPA 1962). Additionally, we note that Binning exemplifies an aromatic polyamide

which is meta- substituted (Example 8; see col. 9, ll. 7-8). Although Hirsch is directed to semicarbonizing materials, we note that the Examiner has merely cited this reference as evidence that NOMEX is known in the art as a heat-resistant material (Answer 10).

For the foregoing reasons and those stated in the Answer, we determine that the Examiner has established a prima facie case of obviousness in view of the reference evidence. Based on the totality of the record, including due consideration of appellant's arguments, we determine that the preponderance of the evidence weighs most heavily in favor of obviousness within the meaning of § 103(a). Therefore, we AFFIRM both rejections on appeal based on the APA, Binning, Lambdin, and Hirsch.

C. Summary

All rejections on appeal have been AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv)(2004).

AFFIRMED

TAW/tf

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